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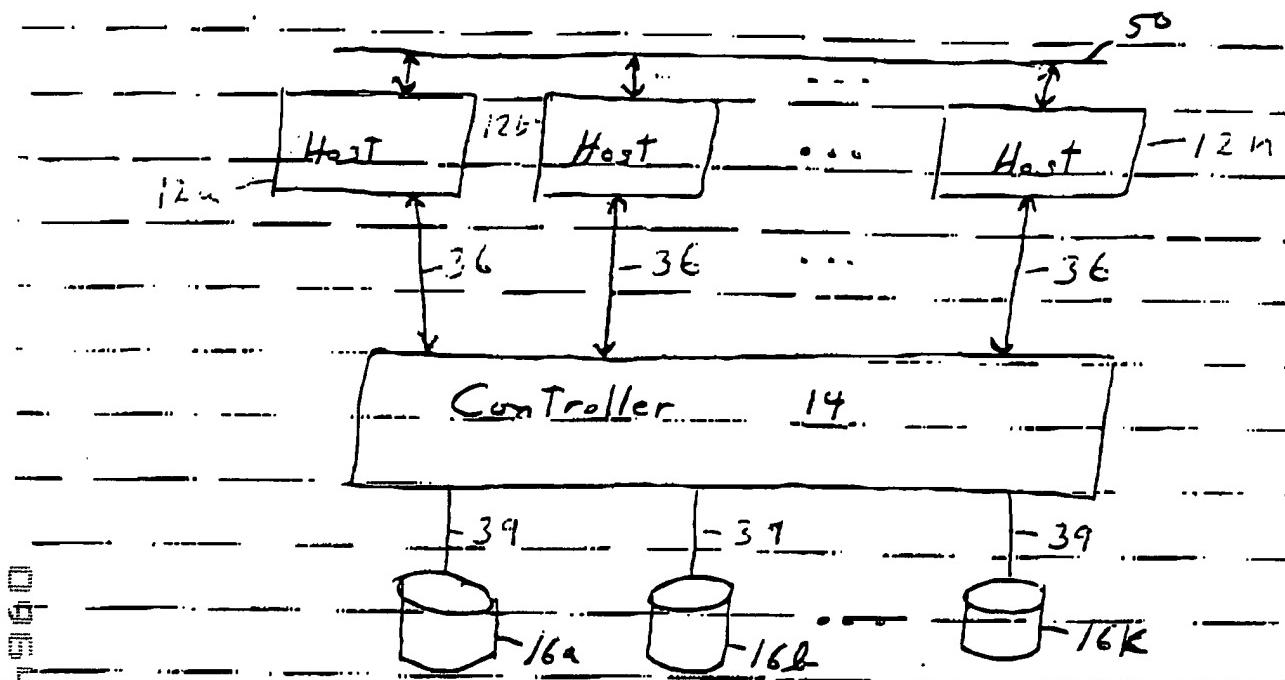


Fig. 1

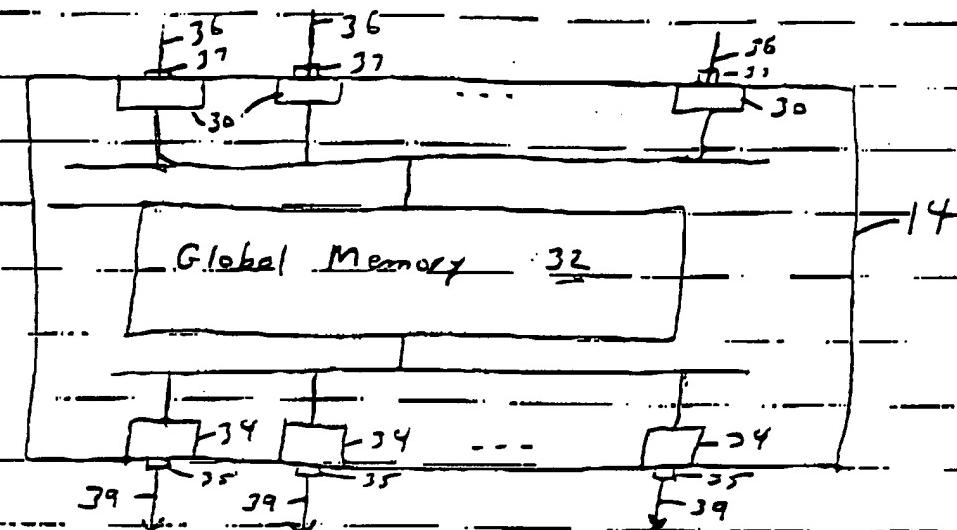


Fig 2

Enter parameters in
master host

60

Begin driver program

62

Synchronize hosts

64

Test storage system

66

Analyze response times

68

Transfer analysis (reduced)
data to the ^{master} host computer

70

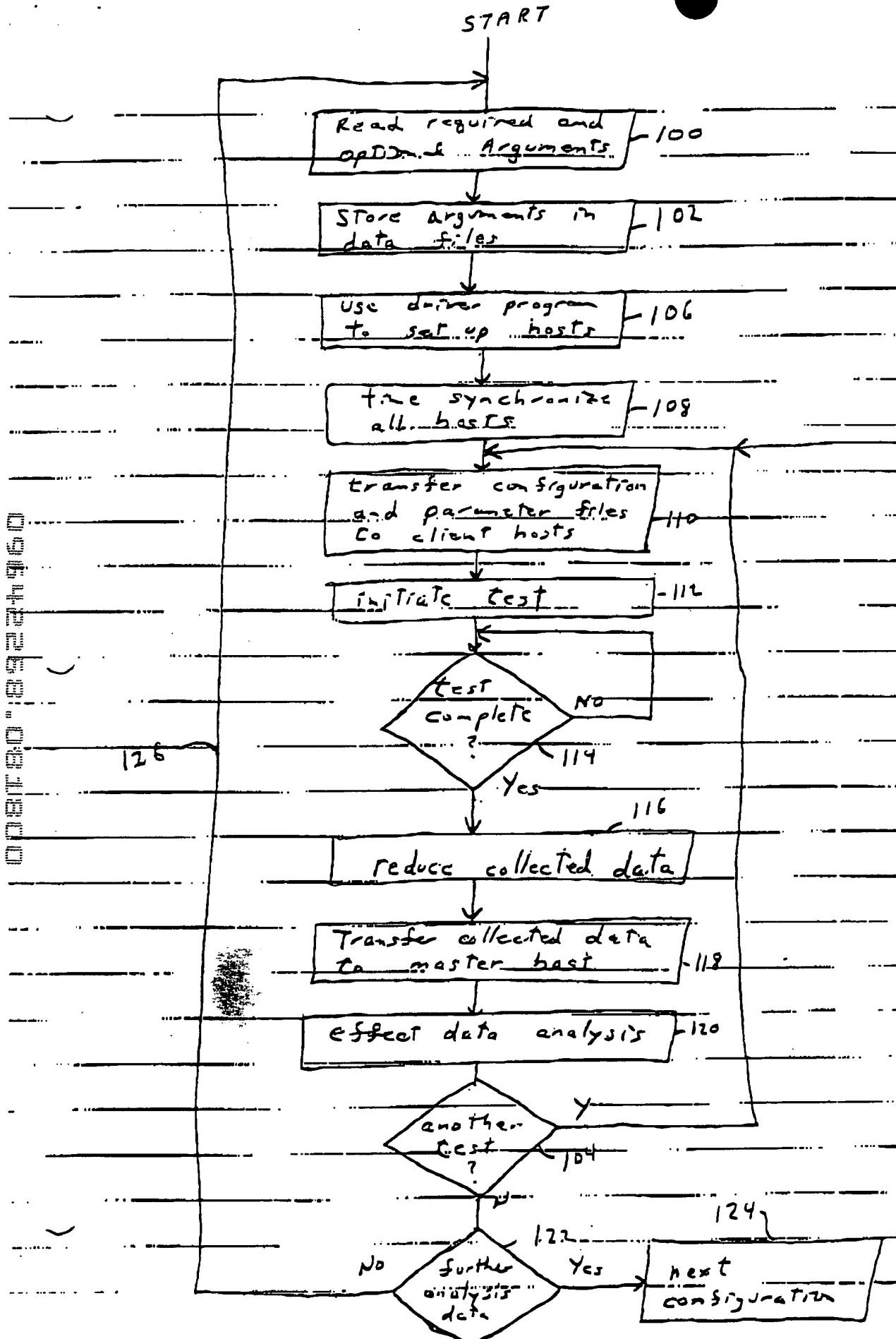
Further analysis at the
^{master} host ~~is necessary or~~
~~test~~

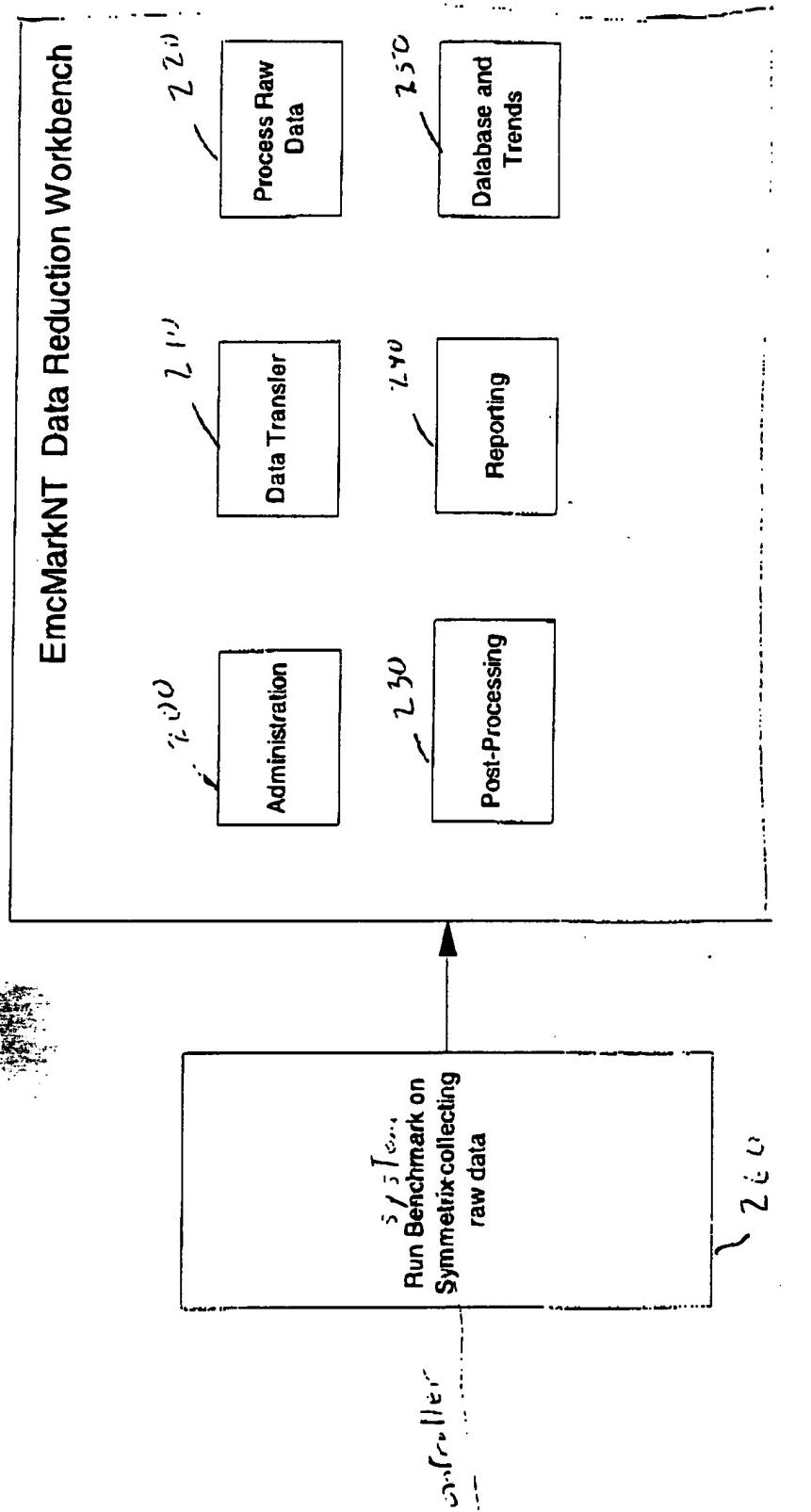
72

Fig. 3

	<u>Number of logical disks</u>
	<u>Number of "child" processes to start</u>
	<u>Number of capture response times</u>
	<u>Number of response times</u>
REQU/R60	<u>Buffer size</u>
	<u>Offset size</u>
	<u>Maximum range</u>
	<u>Time of test</u>
	<u>read/write size</u>
	<u>read/write mix</u>
	<u>ID of devices being tested</u>
	<u>ID of master & client hosts</u>
	<u>I/O type (sequential or random)</u>
	<u>Number of I/O operations performed to correct errors</u>
	<u>Displacement from offset</u>
	<u>Delay between commands</u>
OPTIONAL	<u>Initial byte offset</u>
	<u>Number of seeks for random I/O</u>
	<u>Data reduction method</u>
OPT	<u>ICDA percent hit rate</u>

Fig. 4





EmcMarkNT Data Reduction Workbench Flow

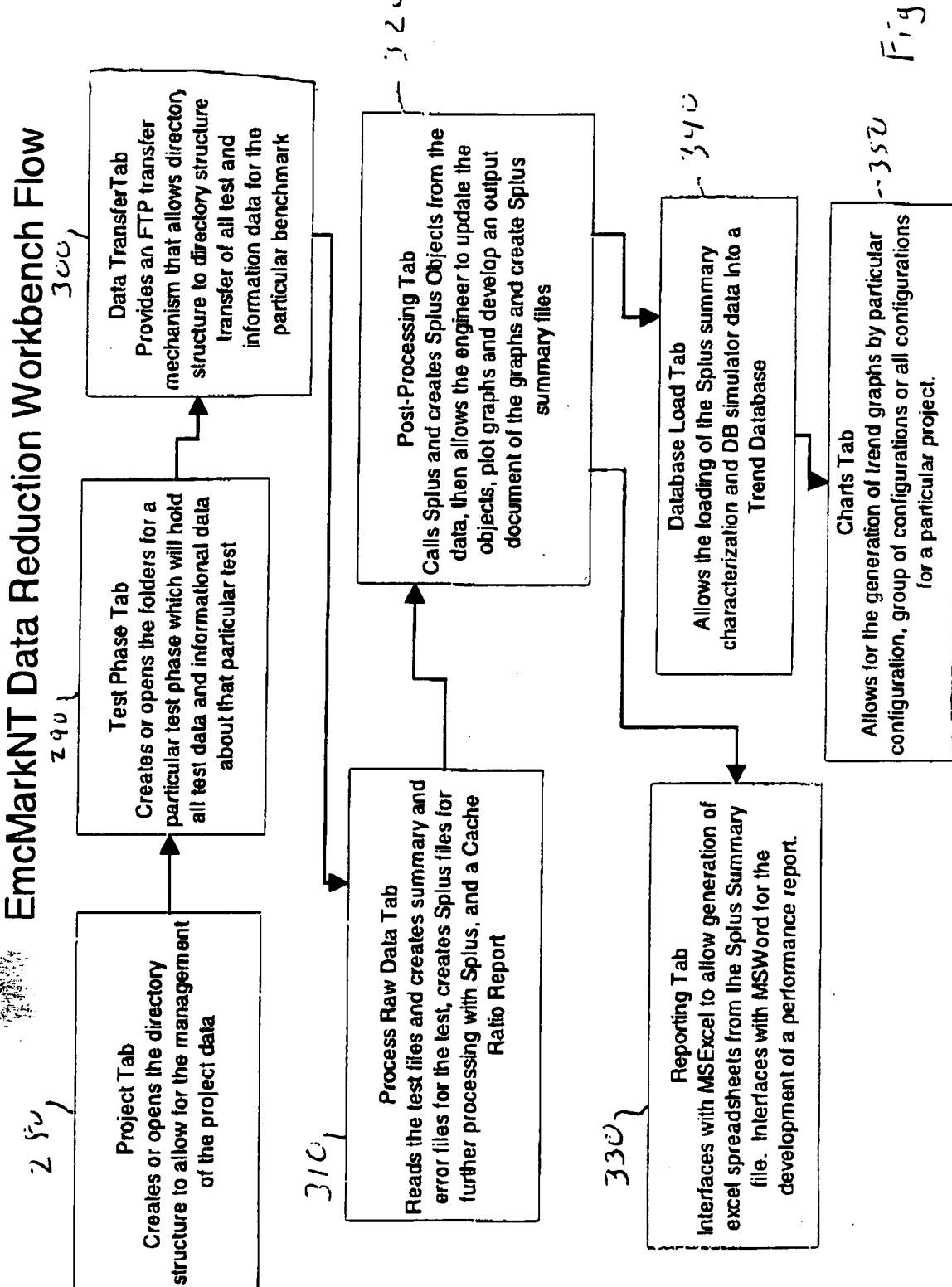
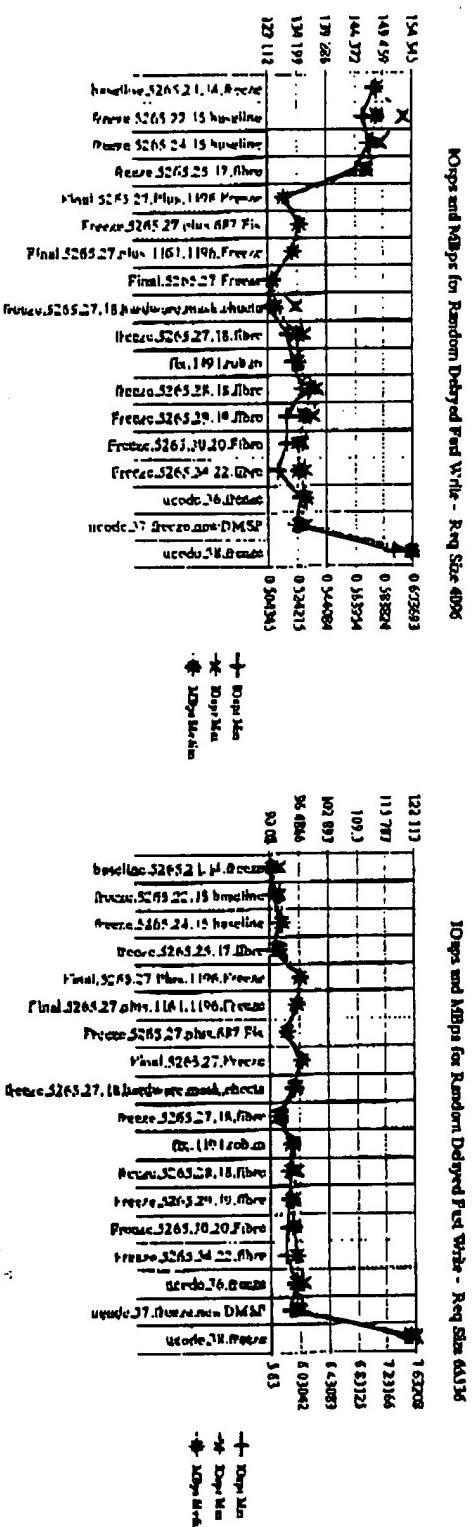
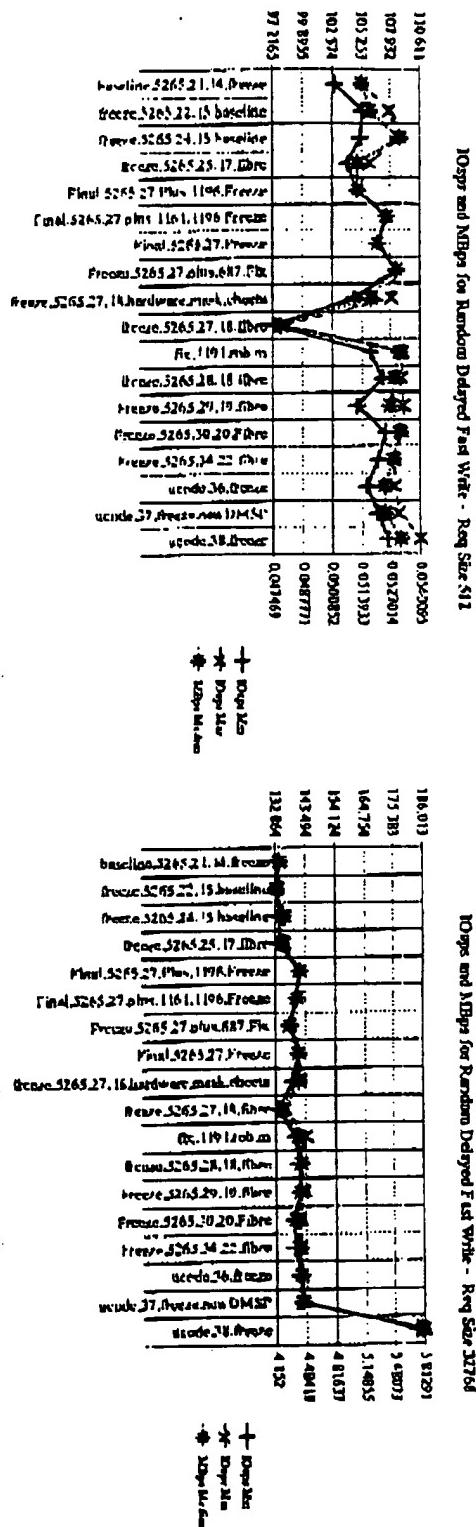


Fig. 7

- 352

AUG-17-00 01:30
F-765

Symm 48, 5265, fibre



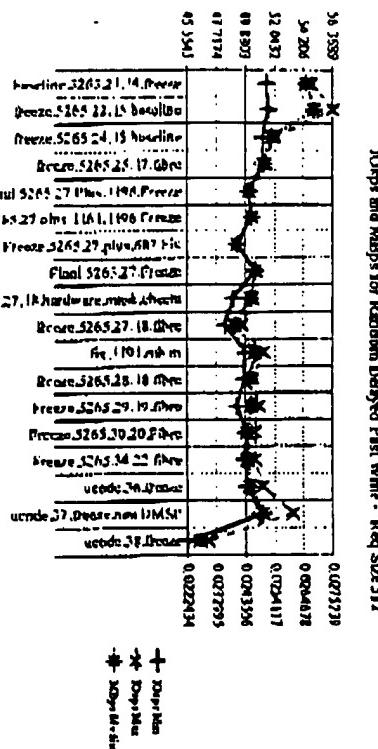
EA - 1 EASPer - 1 EAPer - 1 DA - 1 DAPer - 1 DAPart - 1 DAtre - 1 Lass - 1 Mjor - 1

BA - J BAPT - J BAFM - J DA - J DABM - J DADM - J DMS - J RPS - J

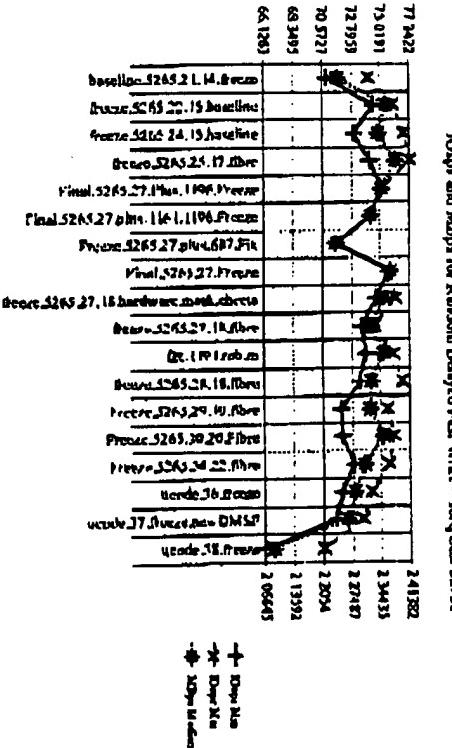
00/61/10

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symmetric fibre



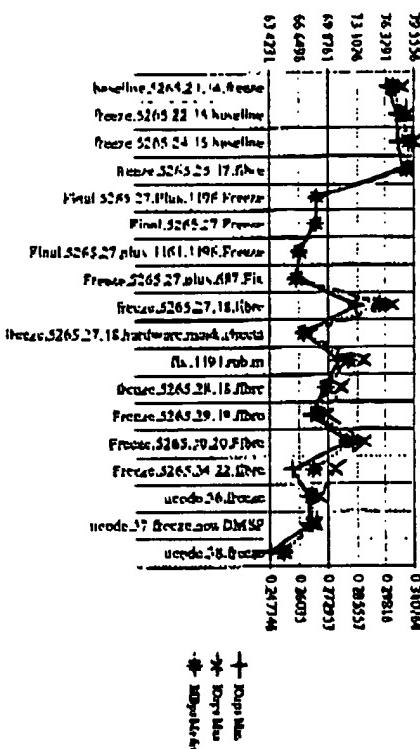
10ops and MELPs for Random Delayed Post Write - Req Size 1111



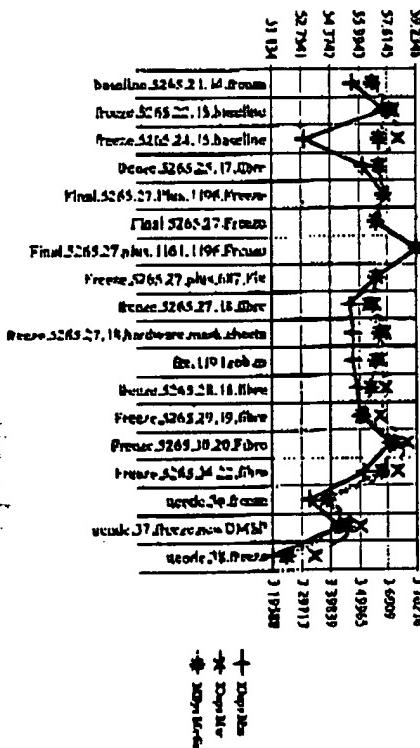
Order and Methods for Random Delayed Read Write - Avg Size 32768



10aps and MBpi for Random Delayed Fair Share - Rq Size 64KJ



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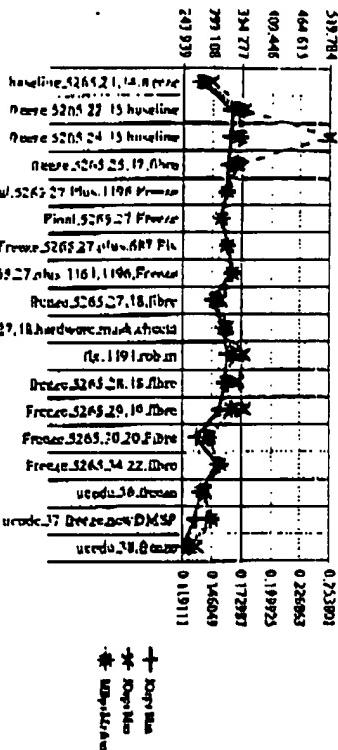
DA - 4 KARDET - 4 BAJWAL - 4 DA - J DAHMI - 1 DASPER - 1 DAVIS - 1 HAN - 6 HYPER - 4

RA - 4 BABY - 4 BABY - 4 BA - 7 BABY - 1 BABY - 3 BABY - 3 BABY - 1 L

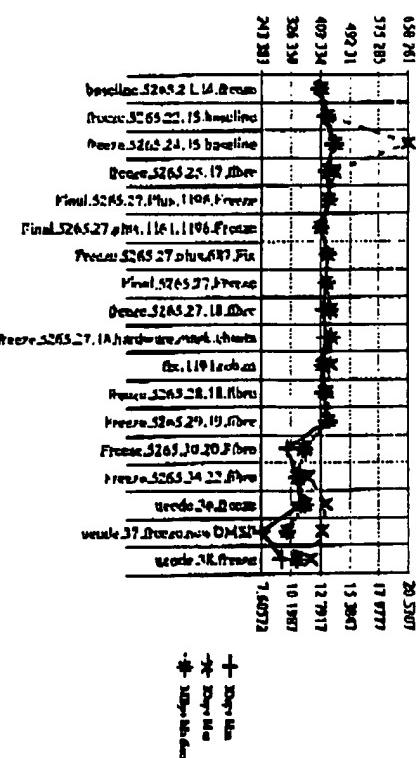
00/09/10

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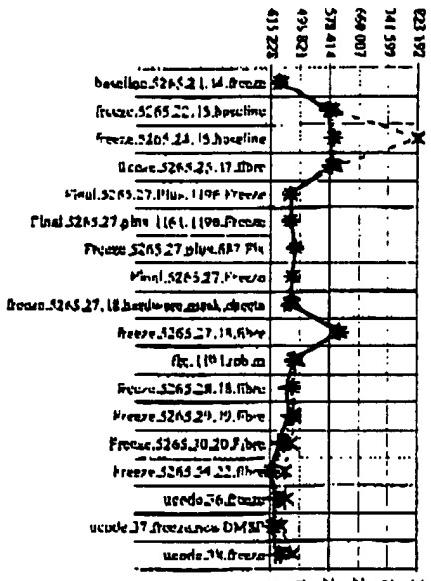
1 Spec and Implementation for Random Delayed Fast Write - ReqSize 512



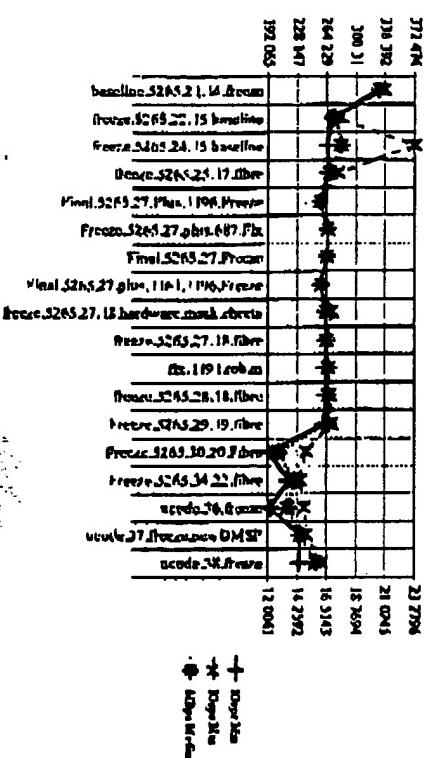
FORMS FOR RANDOM PREDICTION FROM WHITE-ROSE 3176



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KUNJU NEMPUR KULANG DASYED PILA WHIE: KEGIATAN MUSIK

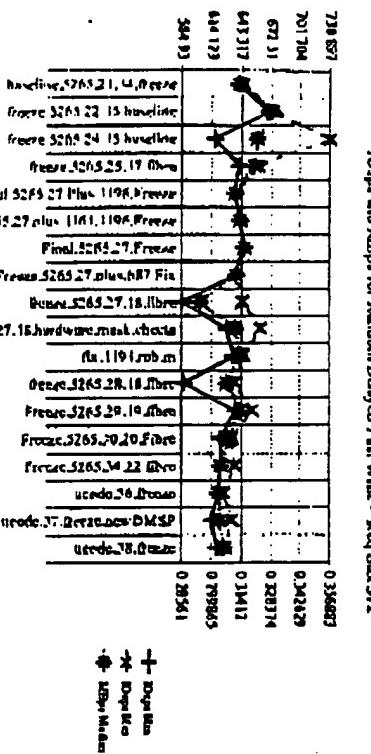


ED - 6 DAFter - 3 BAPer - 8 DA - 2 DAFter - 1 DAPer - 1 Detr - 13 Bas - 24 Biper - 4

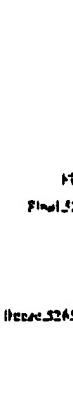
0016110

EMC Confidential

symm48.5265, fibre



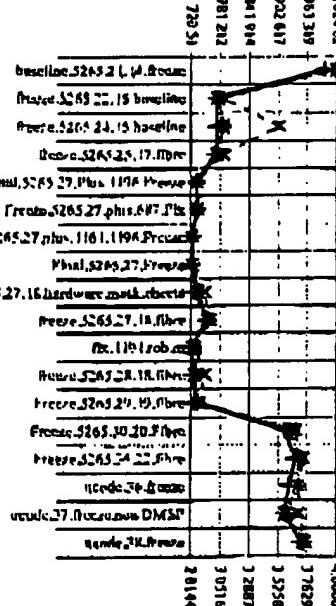
10ops and NBps for Random Delayed First Write - Req Size 32K



HA - 1 HAFter - 1 HAfter - 1 DA - 1 DAfter - 1 DAfter - 1 DAfter - 1 DAfter - 1 DAfter

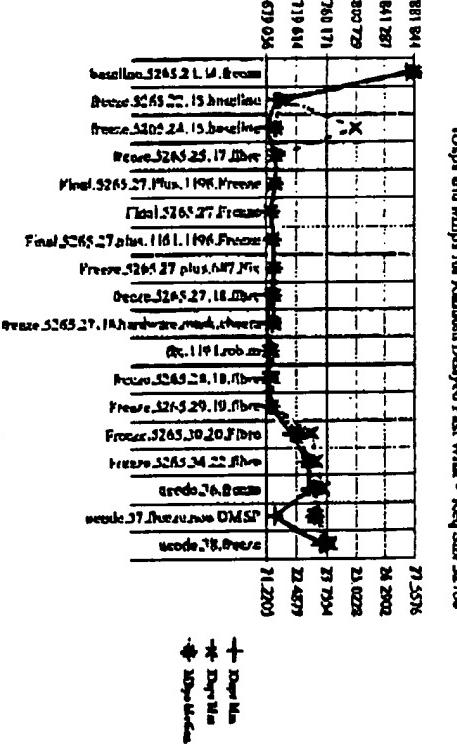
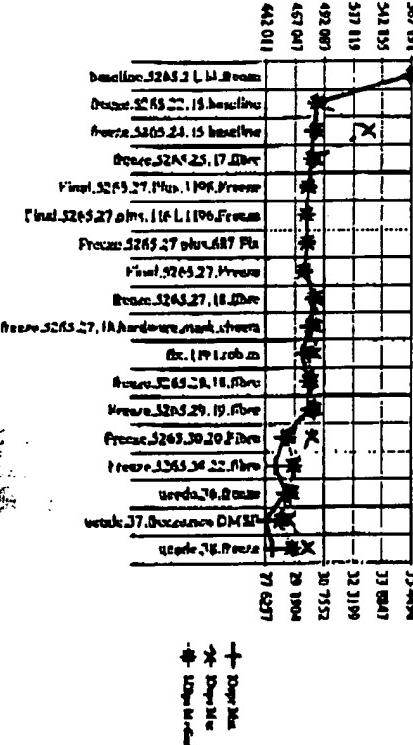


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Fimy
Grae. S.

EA - 4 HADPer - 4 RAFArel - 3 DA - J DAFPer - J DAFrel - 4 DirPer - 24 Lur - 40 RHPer - 4



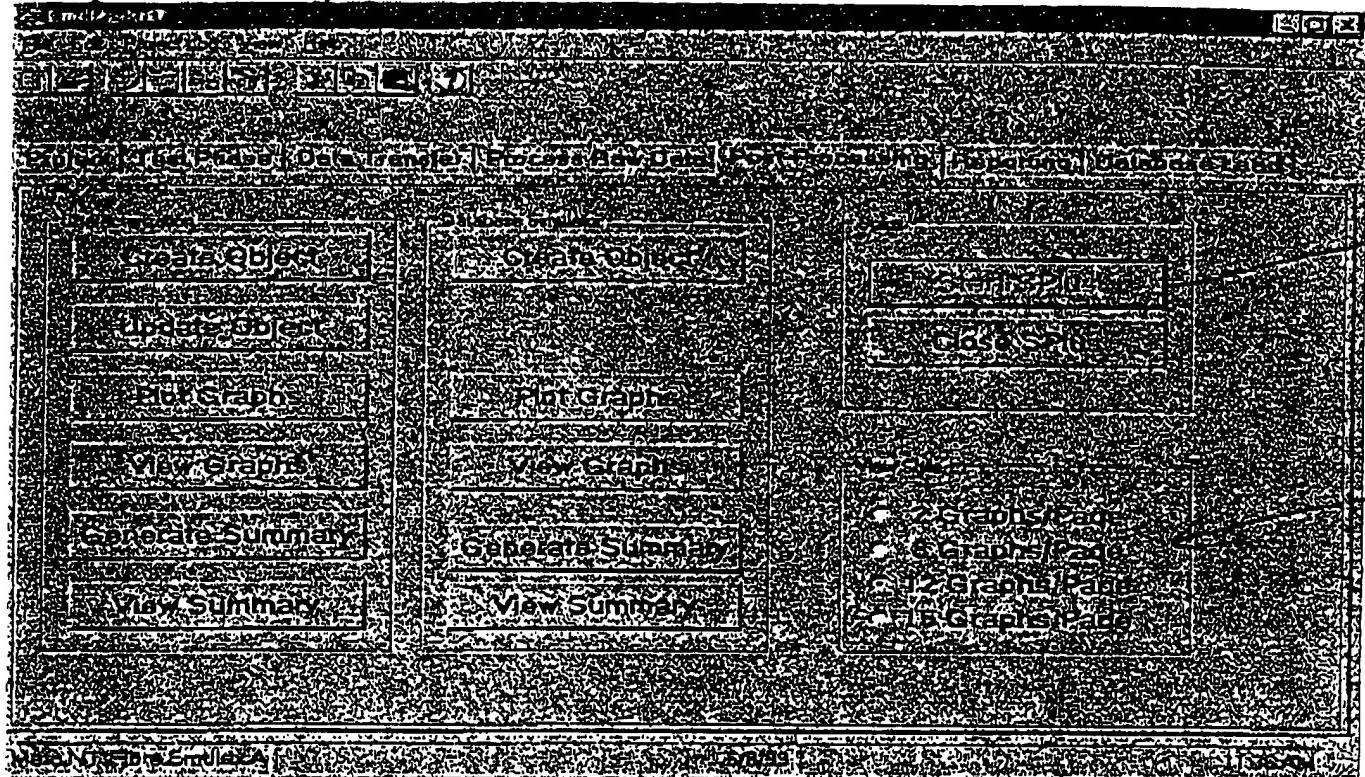
10sp1 and MBpi for Random Destroyed Full Width - Req Size 32768

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Post Processing Tab

The Post Processing Tab creates objects, plot graphs and generates summary files using the Splus Data Analysis Software.



Starting SPlus

Fig. 4

1. Click on the Start Splus Button
(Object buttons will be grayed out until Splus is running. If graphs or summary files have already been created those buttons will be visible)
2. Bring up the Splus window to watch for errors and to use during the Update Objects routine
3. Select 2 graphs/page 8 graphs/page, 12 graphs/page or 15 graphs/page option for viewing the graphs once generated
4. Process Characterization or Database Simulator objects follow instructions on the next page.
5. Select the Close Splus button when you are leaving this tab
(If there is a problem closing Splus, bring up the window and close manually. Select NO twice to its Save Reports and Objects questions)

(If you forget to close Splus before you exit the EMCMarkNT Data Reduction Tool you will need to quit out of Splus from the command line by typing q() or by file -> exit)

6. Go to the Reporting Tab

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Symmetrix Configuration

Symmetrix Configuration View

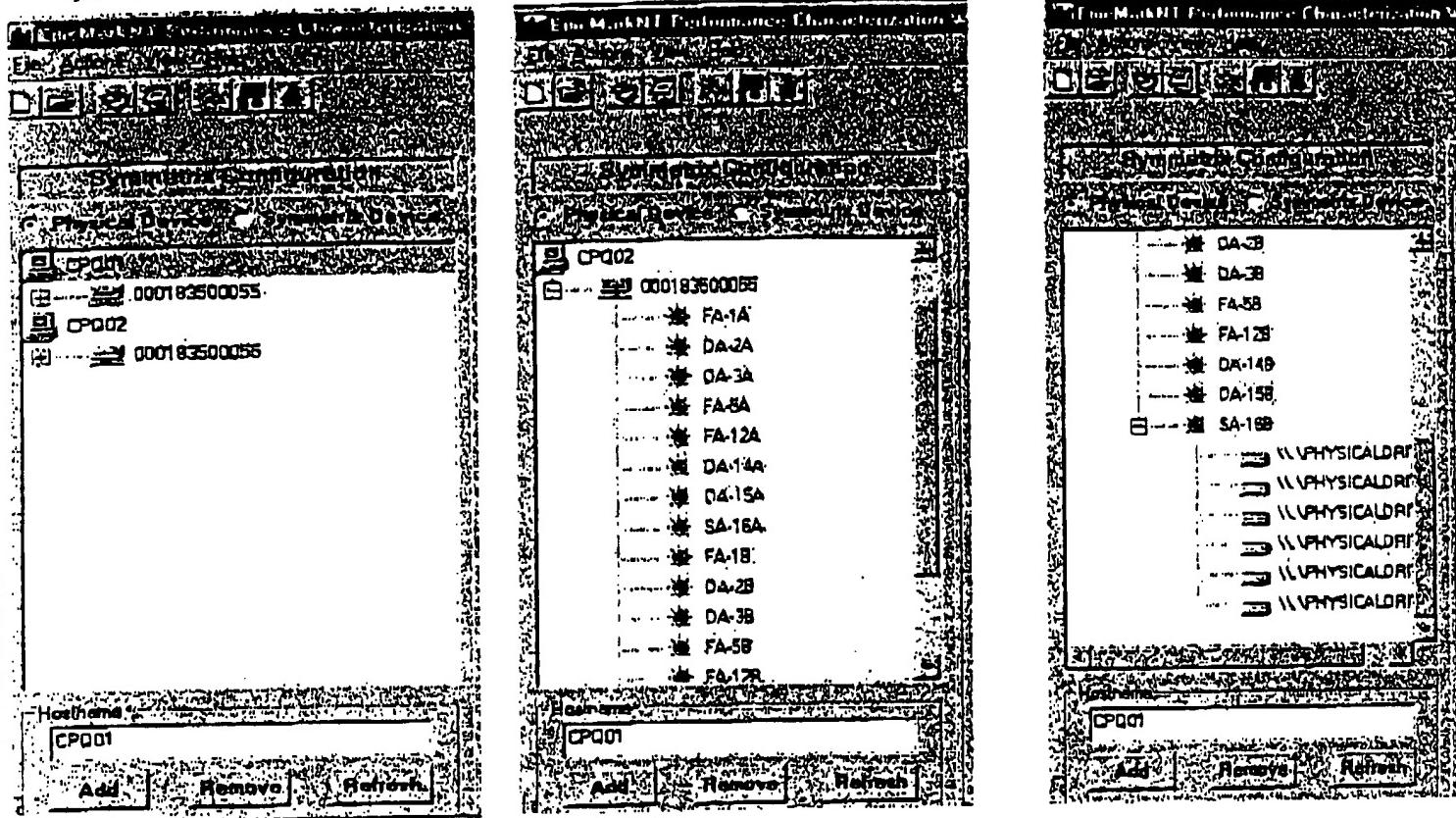


Fig. 9A

Lists the hosts and Symmetrix system

When the Symmetrix is expanded, BAs and DAs will be displayed. Red indicates inactive and green indicates active

Physical Devices - will list the physical device names connected to the Symmetrix

Symmetrix Devices - will list the Symmetrix device names connected to the Symmetrix

Hostname - is the host highlighted on the list

The first host in the list is considered the Master Host

If no host is listed then the host you are on is considered the Master Host

Local, Remote, Gateway

If the Master Host is the host you are on then the job will run locally

If the Master Host is not the host you are on then the job will run remotely, except

If there is a gateway setup in the Environment Tab, then the job will run through the gateway

Add - will add the host name typed in the Hostname box

Remove - will remove the host name typed in the Hostname box

Refresh - will refresh the host/Symmetrix information

Details

Device Details

Device Details

Manufacturer	EMC	Port Count	0
Model	SYMMETRIX	Unit ID	0
Serial Number	000183500055	Chassis ID	2
Director	SA-16B		
Director Model			
Virtual Device ID	000	Allocated Capacity	512
Physical Device ID	11PHYSICALDRIVE0	Decay Factor	7741440
Logical Device ID		Index	8064
Series Number	55000321	Location	FBA
Device Status	Ready	Logical Policy	two-way mirror
CD	<input checked="" type="checkbox"/> META Head	Selected Parent	<input type="checkbox"/> RDU
ASSOC	<input type="checkbox"/> META Member	Previous Path Child	<input type="checkbox"/> BGS
VCM	<input type="checkbox"/> Gatekeeper	Current Path Sibling	<input type="checkbox"/> PCV
Mgmt	<input type="checkbox"/> Multichannel	Next Channel	<input checked="" type="checkbox"/> META

OK

FIG. 9B

Symmetrix Details

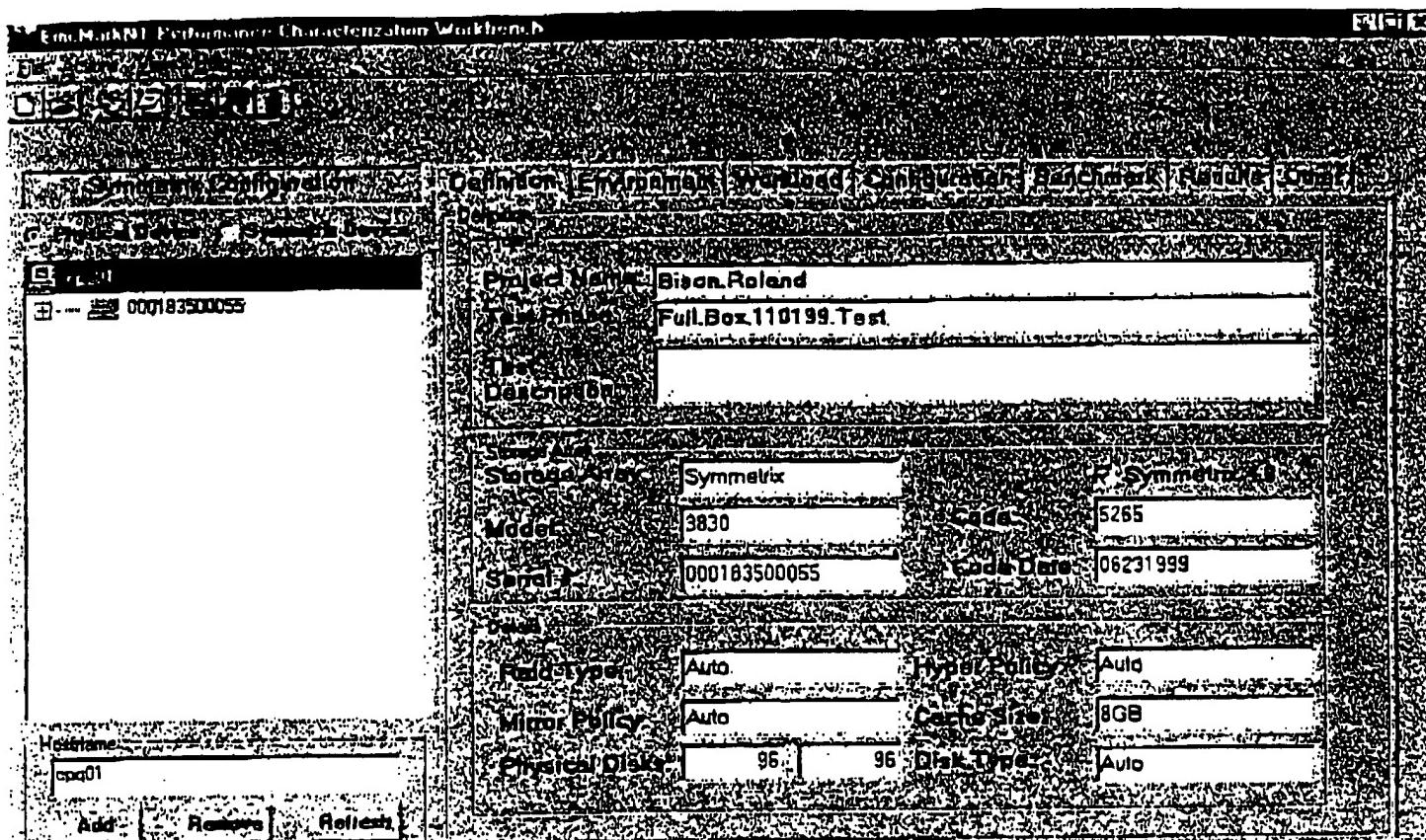
Director Details

Symmetrix			
Director	FA-1A	Num Ports	1
Director Type:	Fibre Adapter	Port 0 status:	On
Director Num:	1	Port 1 status:	N/A
Slot Num:	1	Port 2 status:	N/A
SCSI Width:	N/A	Port 3 status:	N/A

OK

FIG. 9C

Definition Tab



Project name – The project set up for this test.

- Select the New Project button to setup a new project, or the Open Project button to open a different Project.

Test Phase – the Test Phase setup for this test

- Select the New Test Phase button to setup a new test phase, or the Open Test Phase button to open a different Test phase under this project.

Test Description – comes from the ini file located in the Test Phase/Scripts folder

Storage Array Frame and Details Frame information from the ini file located in the Test Phase/Scripts folder. You can manually update the fields, or if you double click on the Symmetrix box the information gathered from the Symmetrix will be populated into those fields and upon exit will be written to the ini file.

Fig. 9D

Environment Tab

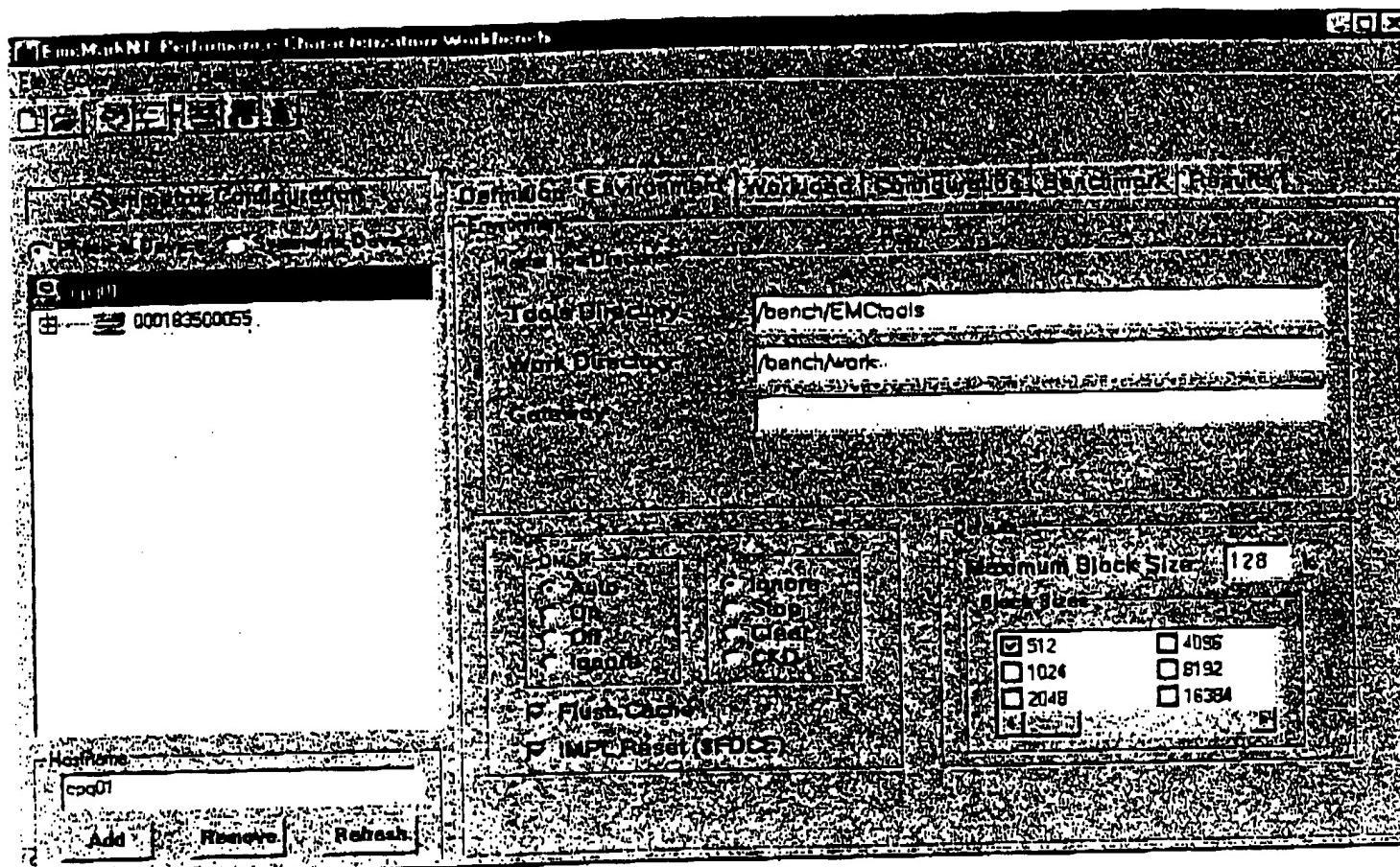


FIG 9E

Tools Directory – where the master scripts are located

Work Directory – your personal work folder

Flags -

DMSP

Trace

Flush Cache -

(MPI) Reset (\$FDCE) -

Defaults – Maximum Block size set to 128k

- Default blocks sizes selected for Workload when run directly from the Workbench

- At startup user edit, must never run time

Workload Tab

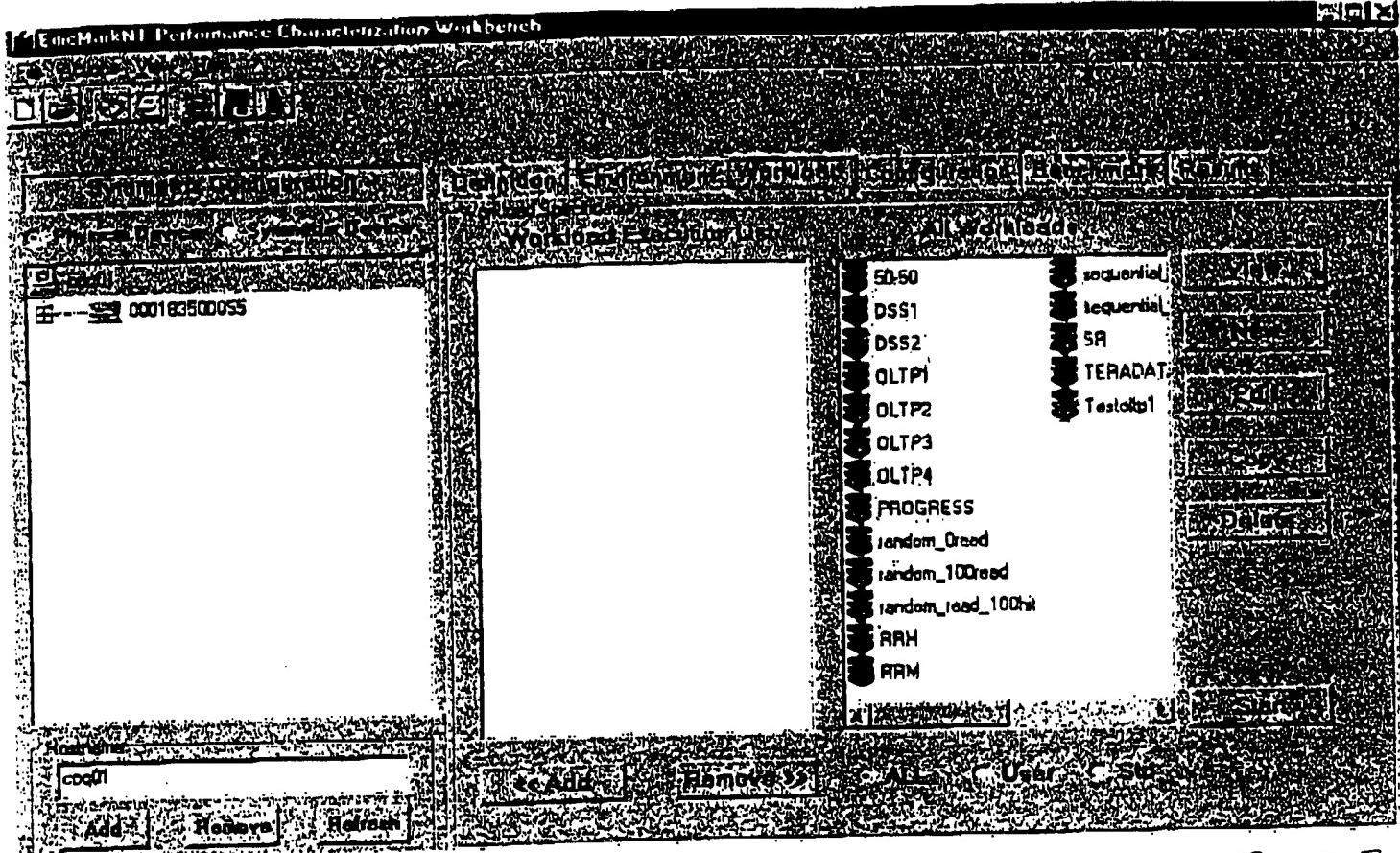


FIG. 9F

All - All available Workloads User - User Defined Workloads Std - Standard Workloads

- Allows viewing of the detailed definition of a Workloads
 - Brings up the Define Workloads form to define a new Workloads
 - Allows editing of User Defined Workloads
 - Copies the selected Workload into a new name, then brings up the Edit screen allowing edits to the new Workload.
 - Only for User Defined Workloads. Allows the deletion of a Workload.
 - Moves the selected Workload over to the Workloads Execution List.
 - Removes item from the Workloads Execution List to the All Workloads List
 - Brings up the Workloads Execution form to define and start the Workloads

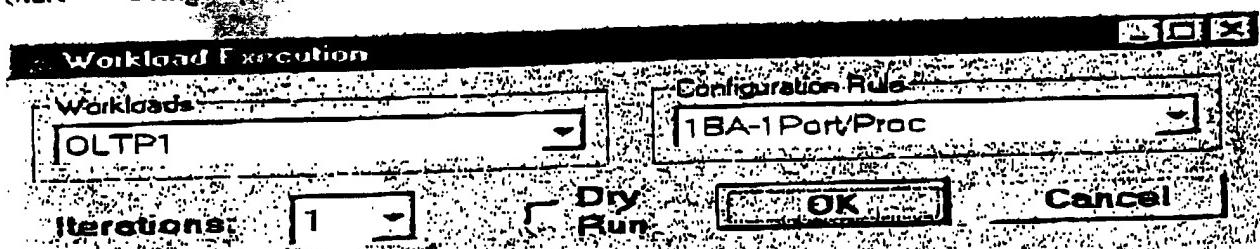


Fig. 95-

Iterations- The number of iterations the Workload should run for

Dry Run - Dry run will run through the scripts but not execute the Workload

Dry Run - Dry run will run through the script, but not execute it.
OK - Will execute the Workload, bringing up the EmcMark Workload monitor window.

Cancel - Will cancel the Workload execution

Define Workload

Response Time Workload

Edit Workload

Testwl1

1	15	Auto	30
210	0	1	3
1	0	0	0

Workload Transaction Definition

Seq	Workload	Read	Write	Size	Align	Block Alignment	Insert	Remove
0	0 MB 4 KB 0 B	50	0	100	0	0 MB 5 KB 0 B	0 MB 0 KB	0 MB 0 KB
1	0 MB 4 KB 0 B	30	0	100	0	0 MB 3 KB 0 B	0 MB 0 KB	0 MB 0 KB
2	0 MB 4 KB 0 B	10	0	100	0	0 MB 5 KB 0 B	0 MB 0 KB	0 MB 0 KB
3	0 MB 4 KB 0 B	10	0	100	0	0 MB 3 KB 0 B	0 MB 0 KB	0 MB 0 KB

Request Size

0	4	0	0	0	5	0	0	0	0
MB	K	B	MB	K	B	MB	K	B	MB

Algorithm

Cache Miss/Hit

Sequential/Random

Write/Read

Z of Workload

F1 - 9.17

- Max Seq count be ϕ . Cache Key - max by 10
 - Min Seq - max w. Max Seq selection - max by 100

Define Workload

Throughput Workload

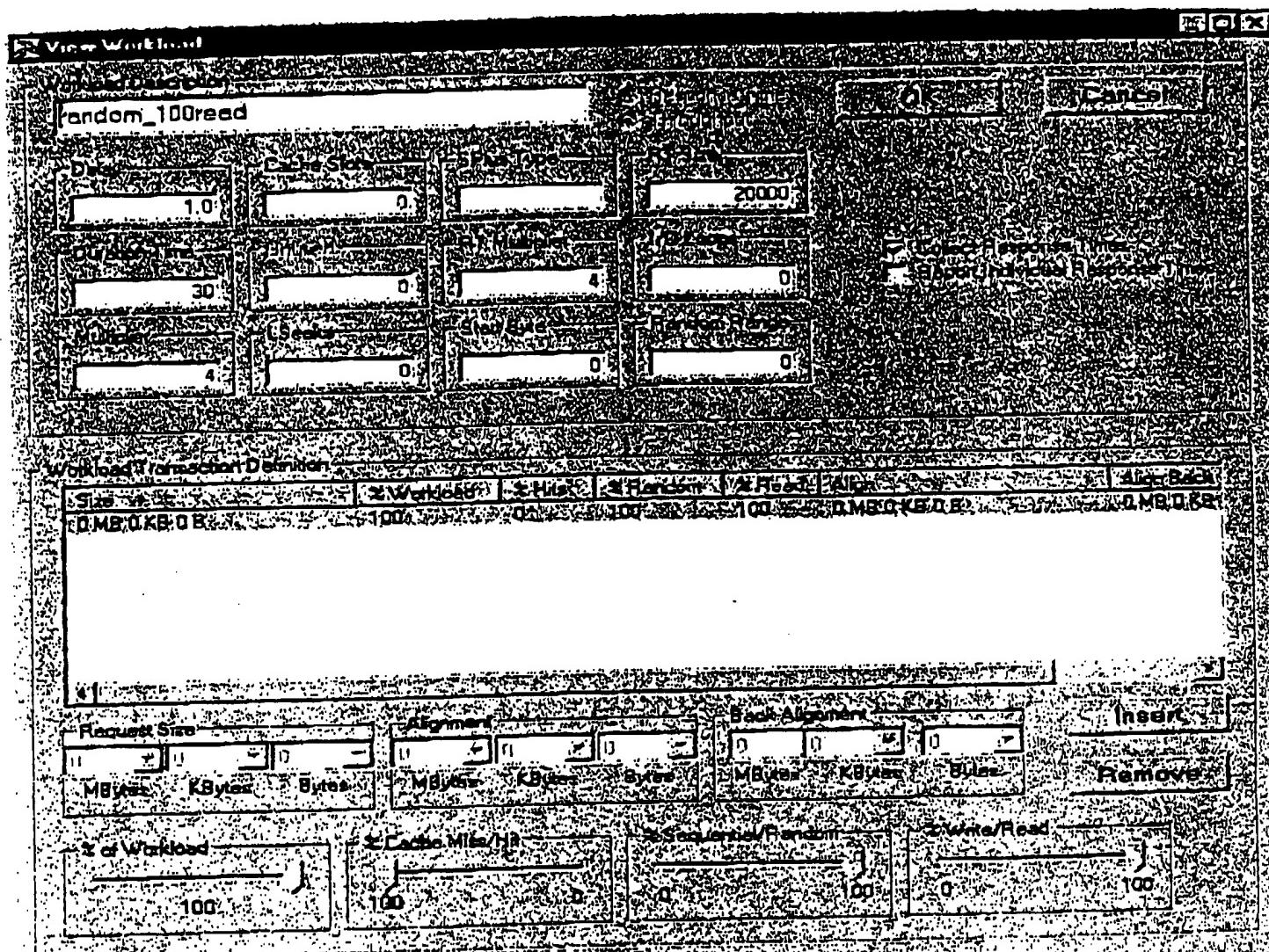
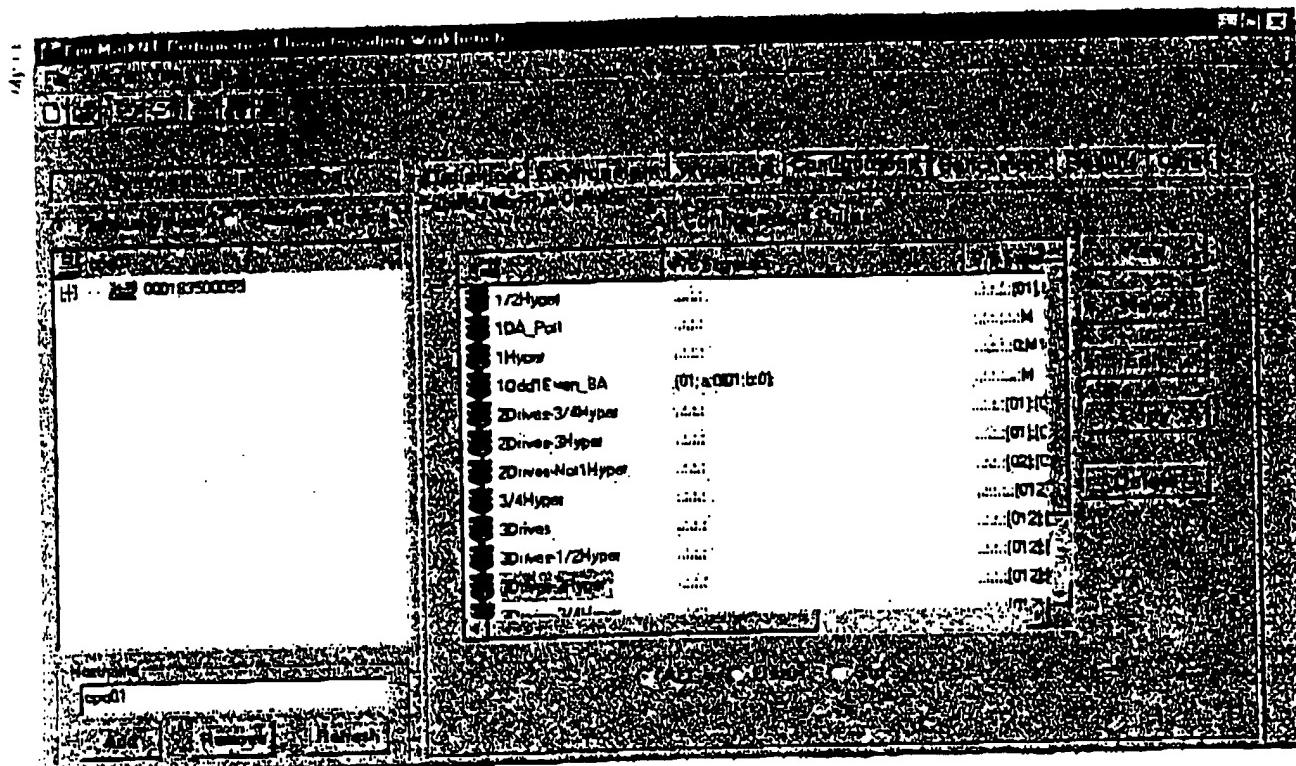


FIG 9E

Configuration Tab



All - All available Rules User - User Defined Rules Std - Standard Rules

Fig. 9]

- View - Allows viewing of the detailed definition of Rule
- New - Brings up the Define Workloads form to define a new Rule
- Edit - Allows editing of User Defined Rules
- Copy - Copies the selected Rule into a new name, then brings up the Edit screen allowing edits to the new Rule.
- Delete - Only for User Defined Rules. Allows the deletion of a Rule.

Define Configuration

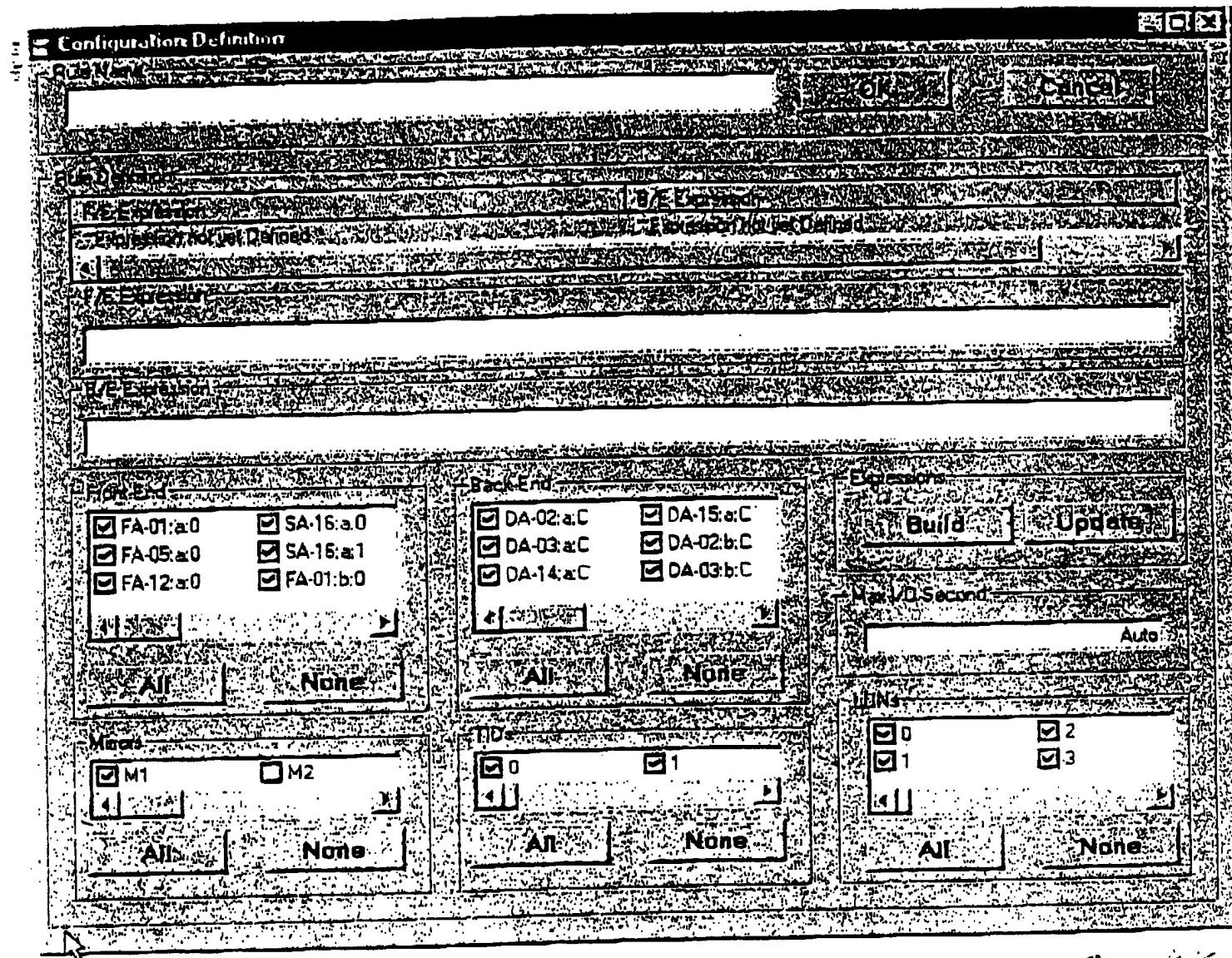


FIG- 7K

Front End - BA/Processor/Port information pulled from SymAPI if Symmetrix connected
 Back End - DA/Processor/Port information pulled from SymAPI if Symmetrix connected

Mirros, TIDs and Luns information pulled from SymAPI if Symmetrix connected

All/None buttons toggle checked boxes on or off.

Build Button – will build the expressions if the information has been downloaded from the Symmetrix. If no information is available then the expressions can be manually added to the F/E Expression and B/E Expression boxes.

Update Button – will update the F/E Expression and B/E Expression into the database.

OK will save the rule into the database

Cancel will terminate the definition

Benchmark Tab

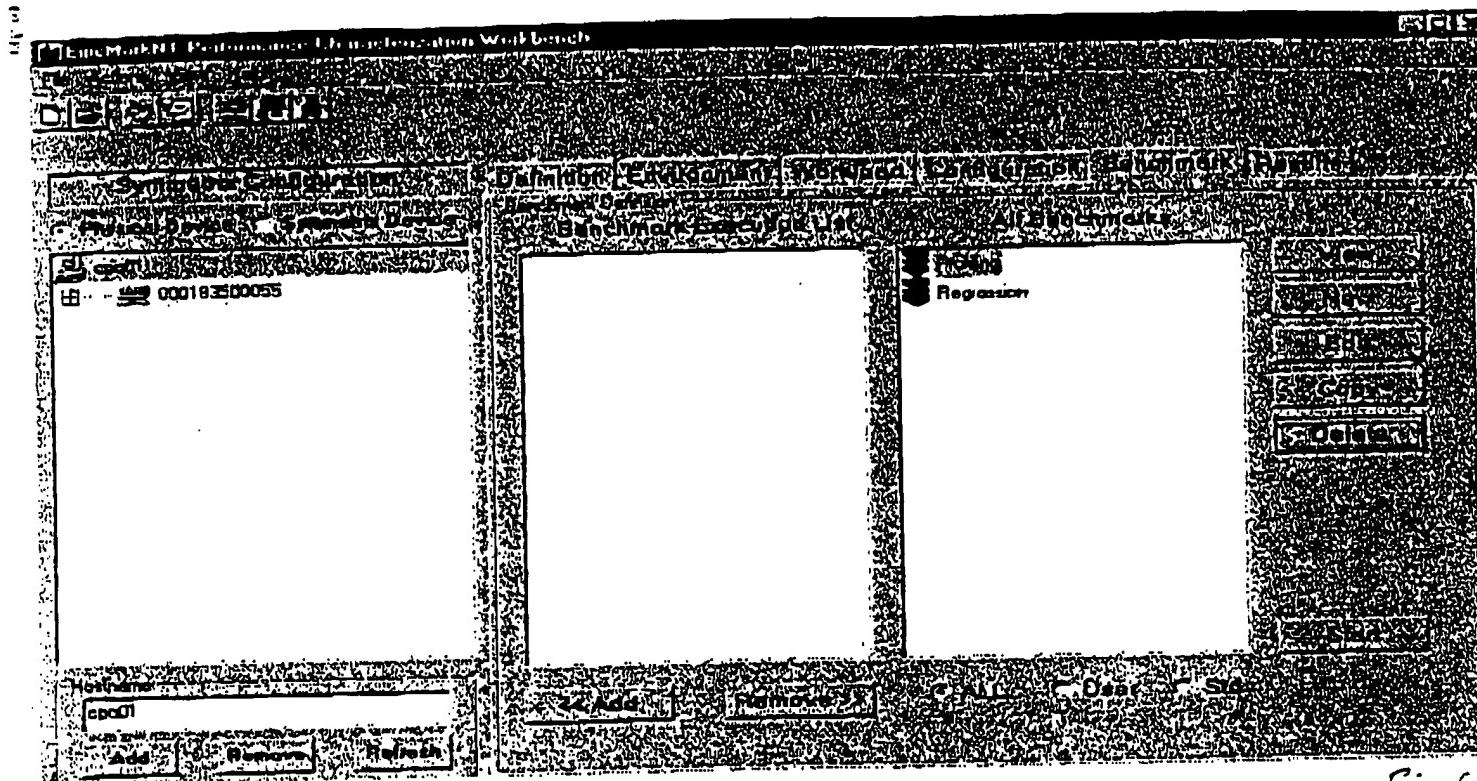
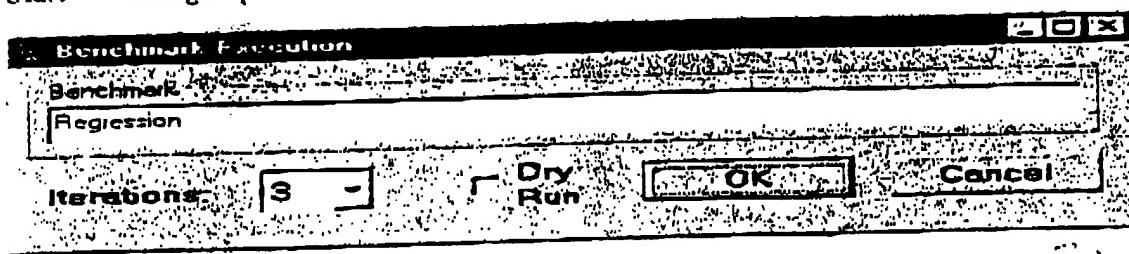


Fig 9

All - All available Benchmarks User - User Defined Benchmarks Std - Standard Benchmarks

- View - Allows viewing of the detailed definition of a benchmark
- New - Brings up the Define Benchmark form to define a new benchmark
- Edit - Allows editing of User Defined Benchmarks
- Copy - Copies the selected benchmark into a new name, then brings up the Edit screen allowing edits to the new benchmark.
- Delete - Only for User Defined Benchmarks. Allows the deletion of a benchmark.
- Add - Moves the selected benchmark over to the Benchmark Execution List. Only one Benchmark can be in the Execution list at a time
- Remove - Removes item from the Benchmark Execution List to the All Benchmarks List
- Start - Brings up the Benchmark Execution form to define and start the benchmark



Iterations - The number of iterations the benchmark should run for

Dry Run - Dry run will run through the scripts but not execute the benchmark

OK - Will execute the benchmark, bringing up the EmcMark Benchmark monitor window

Cancel - Will cancel the benchmark execution

Define Benchmark

View Benchmark

Regression

System	Configuration Rule	Column Size	CacheSize	Memory
RRM	Everything	1	-1	
ARM	Everything	-1	-1	
OLTP1	3Hypers/4Drives	-1	-1	
OLTP2	1Hyper/2Drives	-1	-1	
OLTP3	1Hyper	-1	-1	
DSS1	Everything	-1	-1	
DSS2	2Drives/DA-3Hyper/4Drives	-1	-1	
TERADATA				

Test Parameters

Max Test Period	Min Test Period	Segment	Bucket	Max Segments
1000	0	0	0	1000
Multiplier	1 Seek	Segment	Bucket	Max Segments
1000	0	0	0	1000
Workload	Configuration Rule	Segment	Bucket	Max Segments
RRM	1Hyper	0	0	1000

Buttons: Insert, Remove

F-100-891

Results Tab

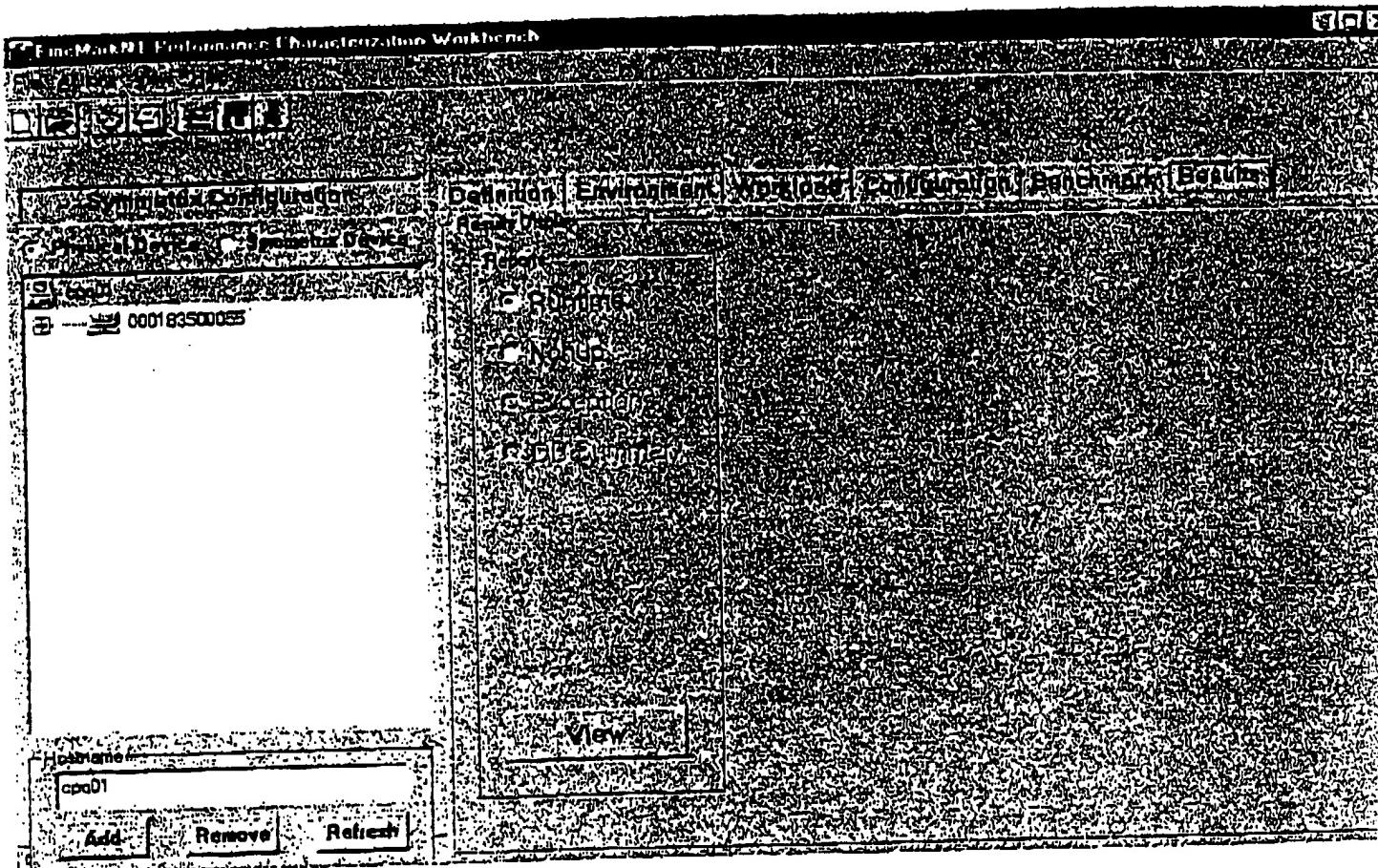


Fig. 9 C

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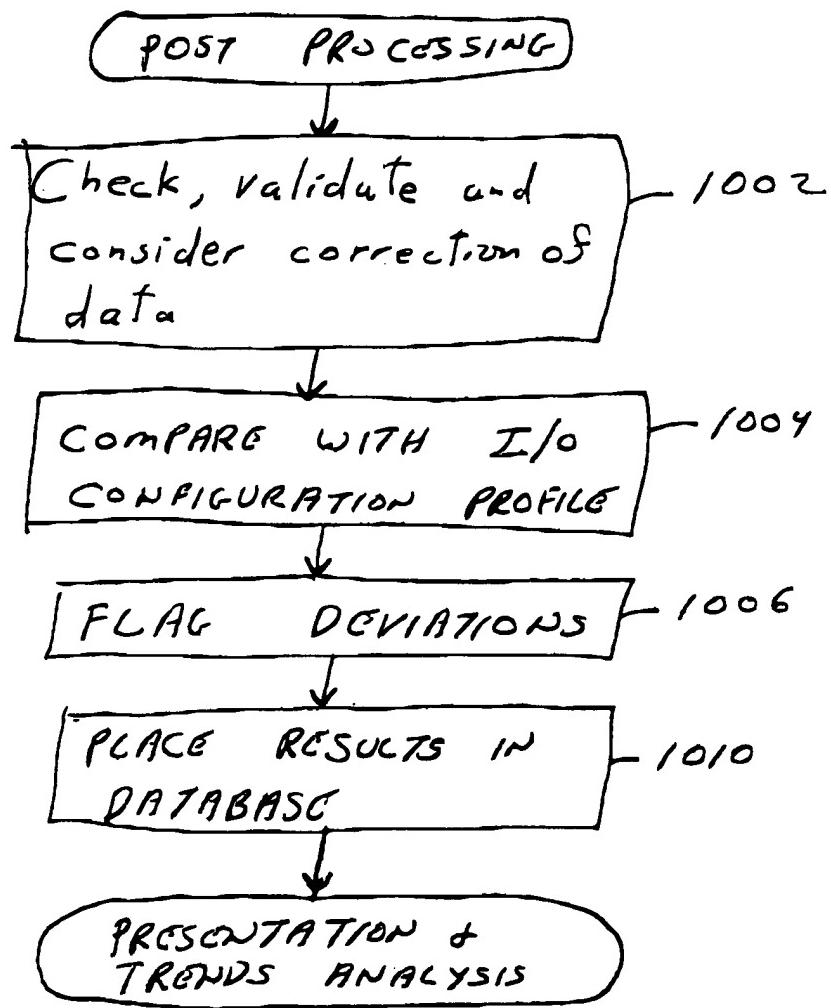


FIG. 10

Process Advanced Characterization Raw Data File

This function is used when your data format is not standard and you need to sort your data in the correct format for Splus to read the file.

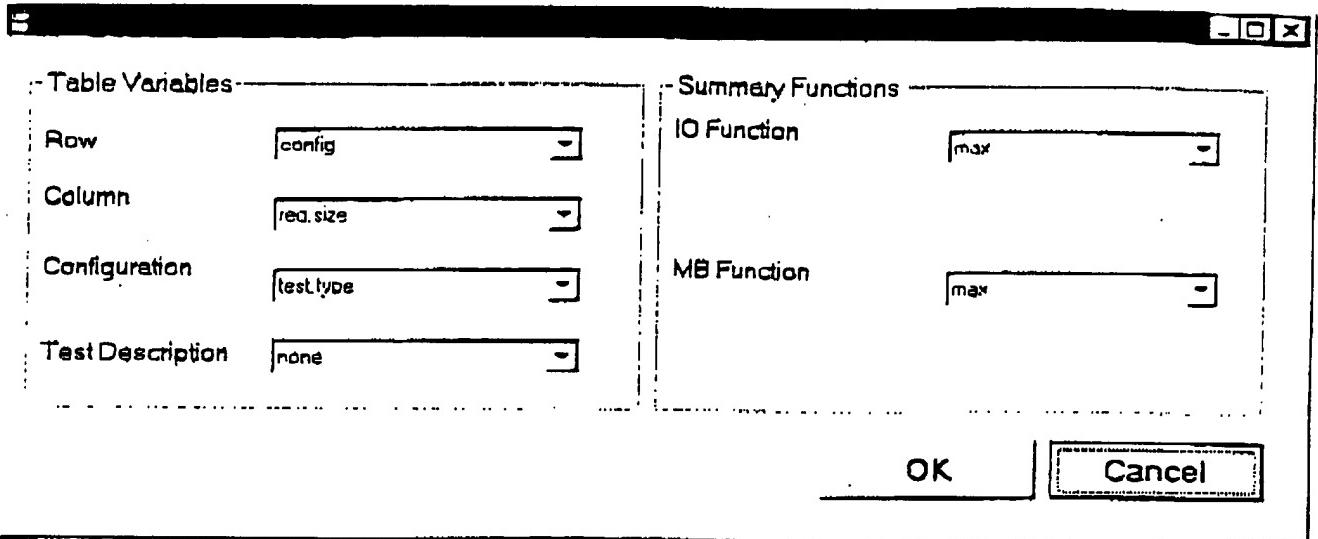


Fig. 10A

1. Select CTRL A
2. The Advanced Characterization Window will appear
3. Select the correct row/column/configuration/test description options for your data
4. Select the summary functions for your data
5. Select OK
6. A Characterization file will be generated in the Post Processing Folder with the extension _adv.txt

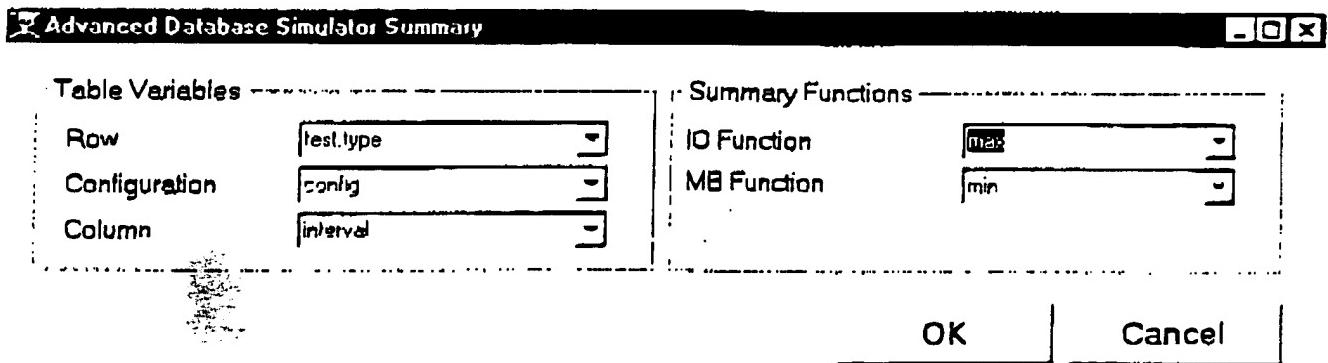
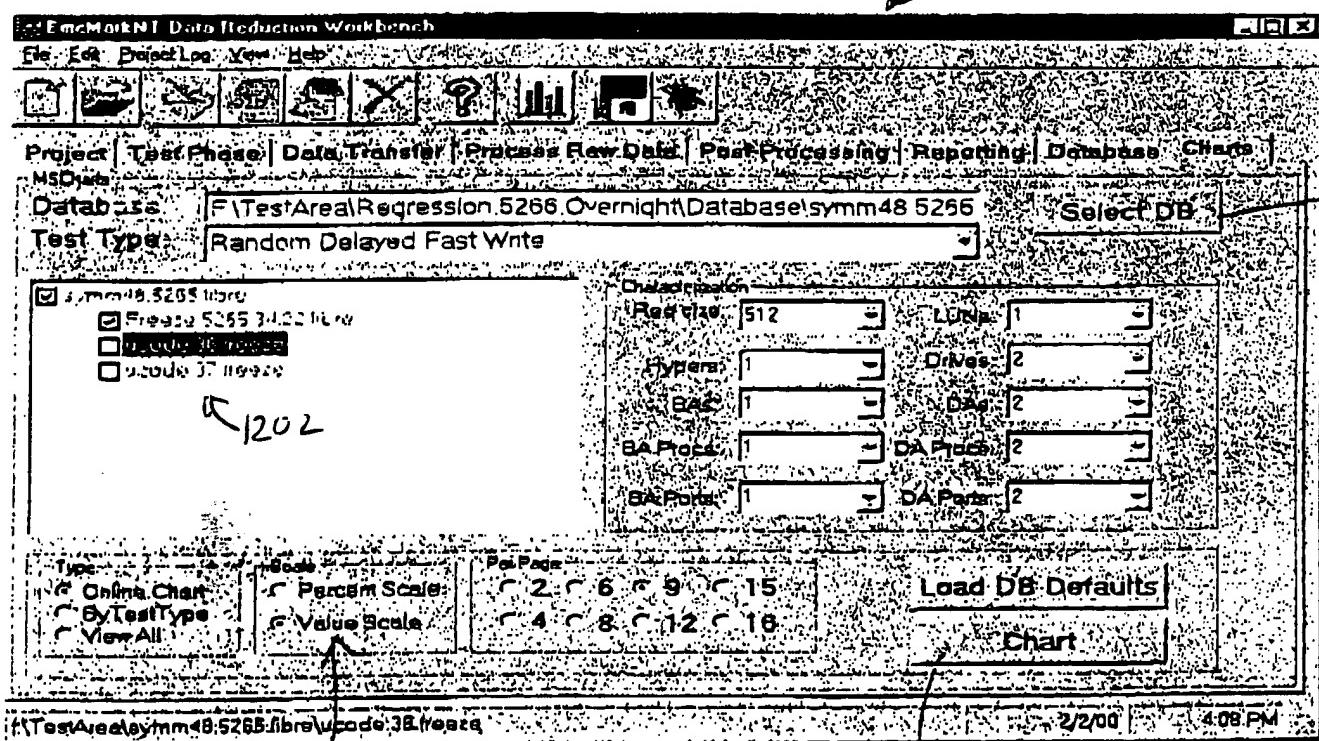
Process Advanced DB Simulator Raw Data File

Fig. 10B

1. Select CTRL B
2. The Advanced DB Simulator Window will appear
3. Select the correct row/column/configuration/test description options for your data
4. Select the summary functions for your data
5. Select OK
6. A DB Simulator file will be generated in the Post Processing Folder with the extension _adv.txt

File Descriptions

File Name	Description	HighLights
Char.Summary	Summary file of each Characterization test broken down by iteration, test type, and configuration	
Char.Splus	Data file feed to Splus to create Characterization Objects	
Char.Errors	Characterization errors produced from processing the raw data files.	Message appears if error file exists.
SX.Summary	SX summary data broken down by iteration, test type and configuration.	
SX.Splus	Data file feed to Splus. Used with Char.Summary file to create Characterization Objects	
SX.Errors	SX errors from processing the raw data files	Message appears if error file exists.
DB.Table	Summary file of each DB Simulator test broken down by iteration, test type and configuration	
DB.Splus	Data file feed to Splus to create DBSimulator Objects	
DB.Errors	DB Simulator errors produced from processing the raw data files	Message appears if error file exists.
SX_DB.Summary	SX DB summary data broken down by iteration, test type and configuration.	
SX_DB.Splus	Data file feed to Splus. Used with DB.Splus file to create DBSimulator Objects	
SX_DB.Errors	SX_DB errors produced from processing the raw data files	Message appears if error file exists.
Cache Ratio Report	Report tracking the Cache ratio from the Sym and the processed data	Report name: "CacheRatioReport.txt" Located in the Raw Data folder Message appears if a report



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Fig. 12